United States Department of Agriculture

Marketing and Regulatory Programs

Animal and Plant Health Inspection Service

Movement of Grapes and Other Regulated Articles from the European Grapevine Moth (*Lobesia botrana*) Quarantine Zone

Environmental Assessment
June 2010

Movement of Grapes and Other Regulated Articles from the European Grapevine Moth (*Lobesia botrana*) Quarantine Zone

Environmental Assessment
June 2010

Agency Contact:
Eileen Smith
National Emergency Response Coordinator
Emergency Management
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 160
Riverdale, MD 20737

Table of Contents

I. Background

Lobesia botrana (*L. botrana*) or European grapevine moth (EGVM) is a significant pest of berries and berry-like fruits in Europe, the Mediterranean, southern Russia, Japan, the Middle East, Near East, Chile, and Northern and Western Africa. EGVM is particularly damaging to grape production because larvae feed on the flowers and berries. In October 2009, EGVM was detected for the first time in the United States in a commercial vineyard in Napa County, California. Since that detection, nearly 50,000 traps to capture EGVM adult males have been placed around the State of California to determine the extent of the infestation. As of May 2010, EGVM has been found in several grape-producing counties in California, including Fresno, Mendocino, Merced, Monterey, Napa, Solano, and Sonoma.

Although EGVM attacks many hosts (such as olives, pomegranate, persimmon, rosemary, and stone fruits), grapes are the primary host and most the most economically vulnerable commodity. EGVM larvae feed on flower buds and fruit, producing both external and internal damage. Often, secondary damage is caused by fruit rotting due to fungal pathogens, such as *Botrytis cinerea*. EGVM adults are generally only active from sunset to sunrise, and fly mainly at dusk, resting on the vines during the day. The females typically mate once, while the males are capable of mating multiple times. Females lay single eggs on the bracts, petals, and stems of flower clusters of host plants in the spring (first generation), and on the berries in the summer (second and third generations). Females can lay up to 160 eggs per cycle, and there may be up to four generations per year in California. Newly hatched larvae are highly mobile and immediately penetrate the flower buds or berries of hosts. In terms of economic damage, the summer generations that feed on fruit are typically the most damaging on grapevines because they directly affect the grape berry. In California, EGVM could cause severe economic impacts on vineyard production (USDA–APHIS, 2010). It has caused significant damage to grape production in Chile, where it was first discovered in 2008, with some vineyards losing their entire crop.

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS) plans to issue a Federal Order that includes measures to control the artificial spread (human-assisted movement) of EGVM to noninfested areas of the U.S by restricting the movement of regulated articles that could host EGVM (see appendix A for a list of regulated articles). The Federal Order designates all or parts of affected counties in California as quarantined areas, and imposes restrictions on the interstate movement of all EGVM host material from these areas. More information on EGVM is available on the APHIS Web site at: http://www.aphis.usda.gov/plant_health/plant_pest_info/eg_moth/index.shtml.

II. Purpose and Need

Under § 412(a) of the Plant Protection Act (7 United States Code (U.S.C.) 7701 et seq.), the Secretary of Agriculture may prohibit or restrict the movement of interstate commerce of any plant or plant product, if the Secretary determines that the prohibition or restriction is necessary to prevent the dissemination of a plant pest within the United States. Under the Act, the Secretary may also issue regulations requiring plants and products moved in interstate commerce to be subject to remedial measures determined necessary to prevent the spread of the pest, or requiring the objects to be accompanied by a permit issued by the Secretary prior to movement.

The purpose of the proposed action is to prevent the artificial spread of EGVM to noninfested areas of the United States where EGVM could establish. This would reduce the potential for damage caused by this pest in areas where EGVM has not been introduced. The artificial spread of EGVM can be reduced by inspection and/or treatment of EGVM host material (regulated articles) to ensure freedom from the pest before potentially affected commodities are moved from the infested area (quarantine zone). Grapes (*Vitis* spp.) are considered to be the highest risk host for spreading EGVM. Processed grape products (such as wine, juice, or raisins) would not contain live EGVM and, therefore, would not require inspection. However, fresh grapes, which will primarily be grapes for table use, are at the highest risk of harboring live EGVM larvae. Fresh grapes harvested from vineyards with no detection of EGVM must be inspected to verify freedom from the pest. APHIS has determined that inspection alone may not prove adequate to prevent the artificial movement of EGVM. Therefore, fresh grapes which are harvested from vineyards near a positive detection of EGVM must be fumigated with methyl bromide to ensure that any EGVM in the shipment are no longer viable before moving outside of the quarantine zone. Other fruits may also harbor EGVM; however, these fruits will be treated with methyl bromide before shipping outside the quarantine zone should EGVM be found during inspection.

This environmental assessment (EA) analyzes the environmental impacts anticipated from implementation of the proposed program actions stated below. This EA has been prepared consistent with the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.) and APHIS' NEPA implementing procedures (7 Code of Federal Regulations (CFR) part 372). Due to the nature of this pest, the quarantine treatments may be initiated prior to the close of the comment period for this EA; however, comments will still be accepted and will educate decisionmakers as to whether any changes should be incorporated into the EGVM program. If comments result in minor changes to the program, the finding of no significant impact (FONSI) will be reissued with the changes;

however, if there are major changes to the program, APHIS will reissue an amended EA and allow for comment on those changes.

III. Alternatives

This EA evaluates two alternatives: (1) the no action alternative that consists of not establishing a quarantine zone and no inspection or treatment of EGVM host material; and, (2) the preferred alternative that establishes a quarantine zone, requires inspection of regulated articles, and requires treatment of some fresh grapes and certain fruit for movement outside of the quarantine zone.

A. No Action Alternative

Under the no action alternative, APHIS would not establish a quarantine zone and would allow unrestricted movement of EGVM host material. No inspections or treatments would be required for host materials transported from EGVM-infested areas. This would allow the artificial spread of EGVM through the unmitigated movement of host materials.

B. The Preferred Alternative

Under the preferred alternative, APHIS would issue a Federal Order to establish a quarantine zone and require inspections and/or treatment of regulated host materials. (See appendix A for a list of regulated articles.) All regulated articles would be inspected and would only be permitted to move outside of the quarantine zone if they are found free of EGVM or are treated as described below. Once harvested, fresh grapes to be moved outside of the quarantine zone that originate from EGVM positive vineyards or vineyards located within 200 meters of EGVM positive vineyards would be treated with the fumigant methyl bromide to ensure that no EGVM life stages are viable.

Conditions for interstate movement of regulated articles as required by the Federal Order:

(a) All persons moving regulated articles interstate must implement an integrated pest management program that includes regular inspections by an inspector at least once every 30 days.

(b) All persons who move regulated articles interstate must maintain records of articles shipped for a period of three years and make such records available to an inspector upon request. In addition, all regulated articles shipped interstate must be adequately labeled with the identity of the origin of the articles to provide for traceback as may be required by an inspector.

(c) Additional article-specific requirements apply as follows:

(1) Nursery stock, trees, shrubs or herbs:

All regulated articles must be inspected and found free from any live stages of EGVM.

All grape (*Vitis* spp.) plants: Flowers and fruit are to be removed prior to movement and disposed of in a manner that eliminates the risk of movement and/or spread of any life stages of EGVM. All dormant grapevines must be treated with a hot water dip for at least 5 minutes at 127 degrees F (52.7C); All non-dormant grapevines must be treated with an APHIS approved treatment.

All olive (*Olea europaea*) plants: Flowers are to be removed prior to movement and disposed of in a manner that eliminates the risk of movement and/or spread of any life stages of EGVM or be treated in a manner that inhibits flowering and fruiting or be treated with an APHIS approved treatment.

(2) Cut flowers, garlands, wreaths, greenery or herbs of any regulated plants must be inspected and found free from any live stages of EGVM.

(3) Plant litter, compost, winery/processing or harvesting waste and all green waste residues must be treated and disposed of in a manner that eliminates the risk of movement and/or spread of any life stages of EGVM or be commercially processed.

(4) Fruits (except as indicated in the exempted articles) growing in EGVM quarantined areas:

Grapes for crushing or processing as raisins may only move under a limited permit to designated facilities outside the quarantine area within California. All conveyances moving or holding grapes must be covered with screens or tarps to minimize spread of any life stage of EGVM. All equipment and conveyances must be thoroughly cleaned at the processing facility. All waste must be disposed of in a manner that eliminates the risk of movement and/or spread of any life stages of EGVM or be commercially processed at a designated composting facility.

Grapes dried on the vine for raisins must be inspected and found to be dried to the extent that they would not support any live stages of EGVM.

Grapes for fresh consumption must meet the following specific requirements for movement:

a. All vineyards in the quarantine area must be trapped at a minimum of one trap per five acres, with a minimum of two traps per vineyard;

b. All waste generated from within the quarantine area must be collected and disposed of within the quarantine area in a manner that eliminates the risk of movement and/or spread of any life stages of EGVM or be commercially processed at a designated composting facility.

1. Vineyards with a positive detection of EGVM:
   a. Grapes harvested for fresh consumption from any positive vineyards and adjacent vineyards located within 200 meters from positive vineyards must receive a post harvest treatment (currently T101 protocol, per APHIS–PPQ Treatment Manual) to eliminate all life stages of EGVM.

2. Vineyards with no detections of EGVM:
   a. Grapes harvested for fresh consumption from any negative vineyards must be inspected in accordance with APHIS inspection protocols to verify freedom from the pest.

Fruits other than grapes must be inspected and found free from all life stages of EGVM. Treatment is not required for fruits other than grapes, unless they are inspected and found to be infested with EGVM, in which case, remedial measures (currently T101 protocol, per APHIS–PPQ Treatment Manual) must be applied at the direction of an inspector to address the infestation prior to interstate movement.

(5) Farm and/or vineyard equipment:

a. All mechanized farm and/or vineyard equipment or conveyances leaving vineyards, fields and/or other infested areas at any time must be either (1) pressure washed to ensure that all plant litter, debris and/or all types of waste have been removed, or (2) steam treated in accordance with PPQ Treatment Manual schedule T406-d and applicable conditions of 7 CFR Part 305.

b. All non-mechanized farm and/or vineyard equipment or conveyances must be kept free and clean of plant litter, debris and all types of waste.

c. All waste derived from these actions must be disposed of in a manner that eliminates the risk of movement and/or spread of any life stages of EGVM or be commercially processed at a designated composting facility.

(6) All living, dead, cut, fallen or other materials or products (i.e. fence posts) used in a farm/vineyard are prohibited from interstate movement.

(7) All petioles and leaf blades of *Vitis sp*. collected for laboratory analysis require a USDA issued plant pest permit for interstate movement.

Limited permits may be issued by an inspector for the interstate movement of regulated articles that are ineligible for a certificate but that can be moved interstate for limited handling, utilization, and/or processing when, upon evaluation of the circumstances involved in each specific case (including consultation with the receiving state), the inspector determines that such movement will not result in the spread of EGVM.

The post-harvest treatment that would be required for fresh grapes from positive EGVM vineyards (or vineyards within 200 meters of positive vineyards) and other fruits infested with EGVM is known as the T101 treatment, and is outlined in the APHIS–PPQ Treatment Manual located at: http://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/treatment.pdf.

Table 1. T101 Methyl Bromide Fumigation Schedule for Control of the European Grapevine Moth, *Lobesia botrana* (USDA– APHIS, 2010a).

Temperature	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) at:	
		0.5 Hours	2 Hours
80 °F or above	1.5 pounds	19	14
70–79 °F	2 pounds	26	19
60–69 °F	2.5 pounds	32	24
50–59 °F	3 pounds	38	29
40–49 °F	4 pounds	48	38

IV. Environmental Impacts

The environmental impacts under each alternative are described in detail below.

A. No Action Alternative

EGVM has proven to be a pest of economic importance in Chile, Europe, the Mediterranean, southern Russia, Japan, and Northern and Western Africa (USDA–APHIS, 2010b). The moth feeds on flowers and berries, and is particularly damaging to grape production. In the absence of

preferred hosts, larvae will feed on the fruit and/or flowers of other plants, although damage is expected to be minimal to these plants (USDA–APHIS, 2010b).

Grapes ranked second in total value of production among all crops produced in California (USDA–APHIS, 2010b). Wine, raisins, and fresh grapes for processing (such as grape juice) make up a majority of the grape industry in California (USDA–APHIS, 2010b). However, fresh grapes make up approximately 17 percent of grape products produced in California (USDA–APHIS, 2010b). Most fresh grapes for consumption are grown in the San Joaquin Valley (in Fresno, Kern, and Tulare Counties), and in Riverside County (USDA–APHIS, 2010b).

Ninety-eight percent of the continental United States fresh grapes for consumption are from California. Under the no action alternative, there would be unrestricted movement of EGVM-regulated articles which could include articles infested with EGVM. This would allow EGVM to spread into noninfested areas of the United States through the movement of EGVM host material, especially fresh grapes.

Climate conditions in major grape-producing areas favor the establishment of EGVM. Figure 1 indicates the Southeastern United States, California, Oklahoma, Missouri, and Texas have the greatest risks (USDA–APHIS, 2007a).

In addition, the United States is the world's second largest exporter of fresh grapes, after Chile (USDA–APHIS, 2010b). It is anticipated that the introduction of EGVM into the United States could affect trade with some countries due to additional regulations or restrictions placed on exports of host crops by the importing countries (USDA–APHIS, 2010b).

Without the establishment of control measures, crop damage to vineyards could be up to 80 to 90 percent in some circumstances (USDA–APHIS, 2010b). However, effective treatments with pesticides can reduce crop damage from EGVM to minimal levels (USDA–APHIS, 2010b).

Figure 1. Risk map for *L. botrana* within the continental United States.
Figure 1. Risk map for *L. botrana* within the continental United States.
Figure 1. Risk map for *L. botrana* within the continental United States.

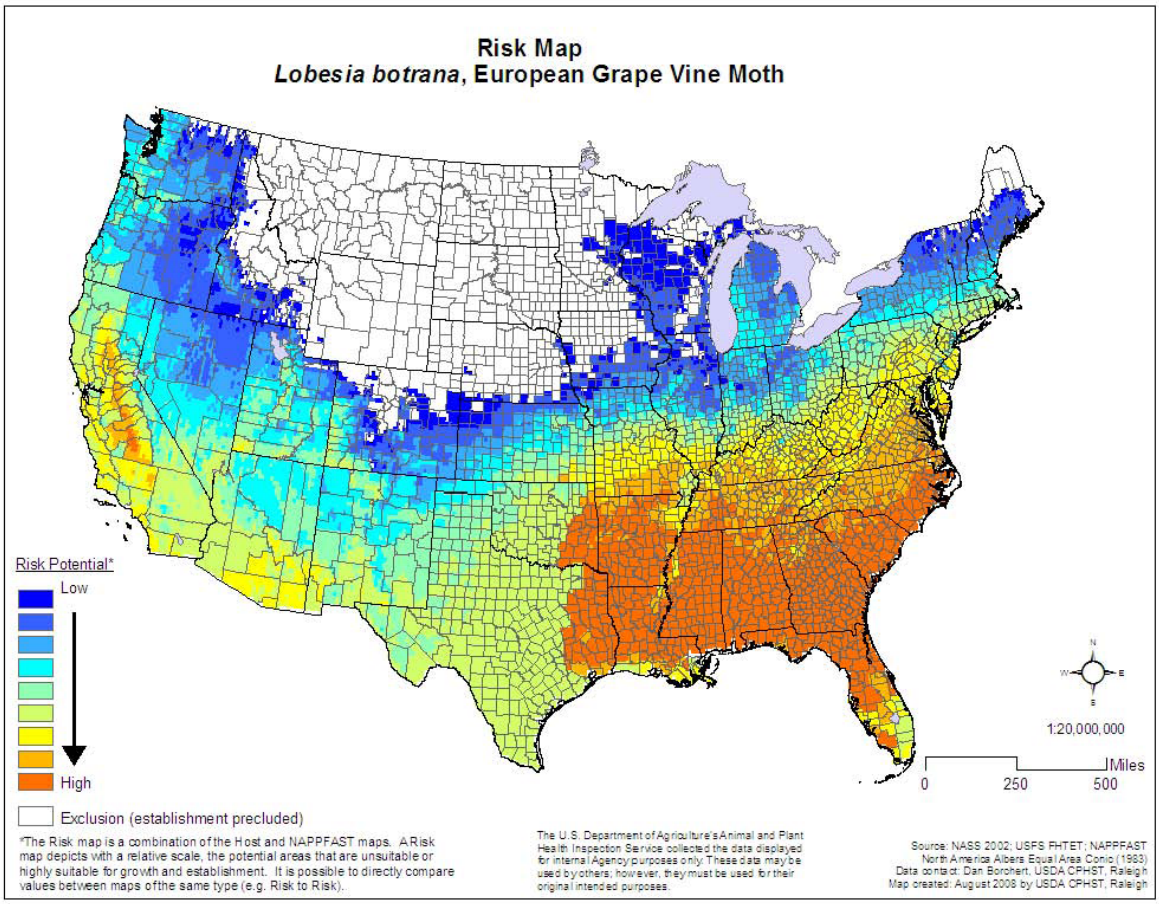

Figure 1. Risk map for *L. botrana* within the continental United States.

Because of the major damage that can be caused by EGVM, two to four insecticide treatments per season are expected to be applied by growers in conventional grape production vineyards in California (USDA–APHIS, 2010b). The insect growth regulator methoxyfenozide (Intrepid® 2F) and the anthranilic diamide Rynaxypyr® (Altacor®) are anticipated to be the most commonly used insecticides, although others, such as indoxacarb, spinetoram, fenpropathrin or beta-cyfluthrin, may be used. Organic growers will likely apply insecticides five to seven times per growing season using organically certified products, such as *Bacillus thuringiensis* var. *kurstaki* (Btk), (DiPel®), and spinosad (Entrust®) (USDA–APHIS, 2010b). It is anticipated that if EGVM were introduced into new areas, these chemicals treatments would also be used. It is important to note that most of these chemicals are used in some vineyards to treat other pests; however, these chemicals are not the most commonly used pesticides in vineyards (CDPR, 2009).

To the extent that these products will be used, this will increase environmental loading of insecticides into areas where grapes are grown and treated for EGVM. Use of these products could also increase the risks of impacts to nontarget fish and wildlife. The proposed insecticides have a relatively low toxicity to birds and mammals and, in most cases, fish; however, products such as fenpropathrin and beta-cyfluthrin are considered highly toxic to fish. Impacts to terrestrial and aquatic

invertebrates will vary based on the type of insecticide and the species tested. Broad spectrum insecticides, such as fenpropathrin and beta-cyfluthrin, will have greater impacts to aquatic and terrestrial invertebrates compared to the more selective toxicity of insecticides, such as Btk. All products have some potential to impact some nontarget invertebrates; however, the severity of the impact will vary based on exposure and mode of action for each insecticide. Depending on the insecticide used, impacts can potentially alter the effectiveness of EGVM parasites and predators in vineyards, as well as decrease the amount of invertebrate prey that are important for terrestrial and aquatic vertebrates, such as wild mammals, amphibians, and fish.

Synthetic pheromone for mating disruption (Isomate-EGVM) is expected to be used by both organic and conventional growers to reduce EGVM populations. Synthetic pheromones used for mating disruption use the insect's own communication system to its detriment. In the wild, female moths release a sex pheromone into the air to attract male moths. Male moths detect the pheromone "scent" and follow it upwind to locate and then mate with the females. The synthetic pheromone (Isomate EGVM) is the same pheromone that is produced by female EGVM moths. The additional pheromone confuses and disorients the male moth, delaying or preventing him from finding and mating with the female. The result is a reduction of mating success and suppression of the EGVM population.

B. The Preferred Alternative

The preferred alternative consists of methyl bromide fumigation, steam sterilization, and pressure washing techniques. There are negligible environmental impacts associated with the use of the steam and pressure washing techniques outlined in the federal order pertaining to the proposed action; therefore, this section will focus on effects from the use of methyl bromide.

Methyl bromide has been used extensively as a broad-spectrum phytosanitary treatment for a wide range of products. Since the 1930s, methyl bromide has been widely adopted for plant quarantine purposes because many plants, vegetables, and some fruits were found to tolerate concentrations that were effective against the insects of concern. Methyl bromide’s efficacy has been the object of considerable scientific research, and has been successful as an industrial and agricultural fumigant for many years.

Fumigation of produce as a preexport treatment is a universal quarantine practice, at both the international and domestic (APHIS) levels. When used in this manner, methyl bromide gas is injected into an enclosure or chamber containing the commodity, which is then exposed (or “treated”) for a predetermined period of time.

In 2008, California Agricultural Statistics furnished by CDFA approximated the total production of fresh grapes for table use for the state to be 973,000 tons. For the vineyards of the 7 counties that would immediately be placed under quarantine by the proposed action (where EGVM detection has been confirmed), production totaled approximately 126,000 tons in 2008.

Adherence to phytosanitary regulations set forth by APHIS to control the movement of pests on interstate shipments of fruits and vegetables (7 CFR § 305.2-h) and following the mandatory treatment schedule of T101 (USDA–APHIS, 2010a) the proposed action would utilize up to 189 tons of methyl bromide, if used to fumigate all fresh grapes for table use grown in the state of California for interstate movement. This amount of methyl bromide is representative of a "worst-case", in which all vineyards that produce fresh grapes for table consumption in the state of California would be placed under quarantine as a result of positive EGVM detection.

If treatment is performed on only those fresh grapes grown with the proposed quarantine areas (currently within the counties of Fresno, Mendocino, Merced, Monterey, Napa, Solano, and Sonoma), the proposed action would utilize approximately 24 tons of methyl bromide in order to facilitate interstate movement. Under the requirements of the Federal Order, only those grapes from vineyards with a positive detection of EGVM and from vineyards within 200 meters of such a vineyard would receive treatment with methyl bromide. Thus, under current conditions, the 24 tons of methyl bromide estimated for treating the 7 counties would likely represent an overestimation of the amount of fumigant to be used in the first year of quarantine.

Other fruits under the purview of the Federal Order related to the proposed action may also be treated according to T101, should EGVM be detected upon inspection. However, the amount of methyl bromide used under these circumstances is expected to be minimal.

Methyl bromide has been identified by the U.S. Environmental Protection Agency (EPA) and the United Nations as an ozone depleting substance (ODS) (EPA, 2009). These substances, which include chlorofluorocarbons (CFCs), are very stable in lower atmospheres of the earth. However, as they eventually drift into the stratosphere, they undergo a series of reactions that destroy ozone. In the presence of ultraviolet (UV) light, these substances react to release chlorine or bromine atoms, which quickly break down ozone molecules. Before the reaction cycle completes, one chlorine or bromine atom can destroy as many as 100,000 ozone molecules (UNEP, 2007).

Increased UV-A and UV-B radiation are known to have adverse effects on plant growth, photosynthesis, protein and pigment content. For humans and domestic animals, increased UV-B radiation is known to have

degrading effects on vision, immune system function, and skin cell regeneration.

There are both human and natural sources of methyl bromide. Human emissions of gases identified by EPA as principal ODS gases have increased substantially since the middle of the 20th century. The production and consumption of these gases by humans are now regulated under the provisions of the *Montreal Protocol on Substances that Deplete the Ozone Layer* (Montreal Protocol), which was signed in 1987 and ratified by the United States for enforcement in 1989.

The Montreal Protocol established legally binding controls for developed and developing nations on the production and consumption of gases known to cause ozone depletion. The purpose is to achieve reductions specifically in stratospheric abundances of chlorine and bromine. These ODS gases are compared in their effectiveness to destroy ozone by an ozone depletion potential rating from 0 to 1, where 1 represents the most effective. Methyl bromide has an ozone depletion potential of 0.51. However, it is important to note some recent conclusions regarding ozone depletion discussed in a variety of scientific assessments (UNEP, 2007; EPA, 2009). Namely, the recognition of the existence of vast natural sources of atmospheric bromines (e.g., oceans and terrestrial ecosystems) allows us to only provide a loose estimate (10 to 40 percent) of the observed increases in atmospheric methyl bromide to attribute to anthropogenic sources. Another factor limiting the ability to properly analyze and determine methyl bromide's precise impact is whether known natural sinks of methyl bromide (processes that reabsorb and remove from the atmosphere) are greater than its known sources.

a. Toxicity of Methyl Bromide

Methyl bromide is an odorless gas that has low to moderate toxicity via oral or inhalation exposure. Methyl bromide has been shown to have high toxicity through dermal and ocular routes of exposure (EPA, 2006). In mammals, the LC_{50} for methyl bromide through inhalation is 780 ppm.

Neurotoxicity is a common yet significant hazard related to inhalation exposure, with neurotoxic exposure effects seen in all tested species of animals, including humans. Acute (1-day) and 90-day inhalation studies using rabbits (EPA, 2006) and rats (EPA, 2008) showed evidence of decreased activity, limb paralysis, ataxia, and tremors, all of which are common signs of inhalation exposure to methyl bromide. Chronic studies using the rat, over a 127-week period, resulted in a lowest observed adverse effects level of 3 ppm, based on respiratory irritation and a systemic toxicity no adverse effect level (NOAEL) of 30 ppm (EPA, 2006). Fetal effects are presumed to occur after one exposure. The human equivalent concentration used for risk assessments performed by EPA was 10 ppm for a 24-hour, time-weighted average to assess non-occupational bystanders and 30 ppm for an 8-hour time-weighted average

to assess occupational exposures (EPA, 2008). Methyl bromide has not been shown to be carcinogenic (EPA, 2006).

b. Exposure and Risk from Methyl Bromide Use Against EGVM

Application rates for commodity fumigations can range from 1 to 20 lb ai/1000 ft^3, but most perishable goods with established food tolerances under 40 CFR have application rates in the range of 1 to 4 lb ai/1000 ft^3 (e.g., grapes). Should it be necessary to treat all fresh grapes grown in California for interstate movement, the proposed action currently estimates the use of 189 tons of methyl bromide for postharvest fumigation. Should treatment only be performed on those fresh grapes grown in the proposed quarantine area (currently within the counties of Fresno, Mendocino, Merced, Montery, Napa, Solano, and Sonoma), the proposed action would utilize approximately 24 tons of methyl bromide. Under the requirements of the Federal Order, only those grapes from vineyards with a positive detection of EGVM and from vineyards within 200 meters of such a vineyard would receive treatment with methyl bromide. Thus, under current conditions, the 24 tons of methyl bromide estimated for treating the 7 counties would likely represent an overestimation of the amount of fumigant to be used in the first year of quarantine.

Exposure is expected to be minimal in both terrestrial and aquatic environments due to the location and method of application (see below), in relation to sensitive or vulnerable systems. While methyl bromide is highly soluble (15.2 g/L) and mobile in soil, the distance of all application areas [either enclosed, regulated facilities or utilizing erected, sealed tarpaulin structures, according to APHIS-mandated protocol (USDA–APHIS, 2010a)] from permeable surfaces and groundwater precludes any exposure that could impact nontarget terrestrial or aquatic organisms.

To minimize risks to industry personnel, all methyl bromide products are classified as restricted use products. Restricted-use products may only be used by a certified pesticide applicator or persons working under their direct supervision. EPA has identified potential human health risks associated with methyl bromide treatments on commodities from acute inhalation exposure to workers and bystanders. "Human exposure to high concentrations of methyl bromide can result in central nervous system and respiratory system failure, as well as specific and severe deleterious actions on the lungs, eyes, and skin" (EPA, 2009). However, adherence to good practices and guidelines should ensure that there are no adverse effects on workers and bystanders. Since the methyl bromide fumigation related to the proposed action will either be conducted in contained facilities or on-site utilizing the tarpaulin procedure (USDA–APHIS, 2010a), potential exposure to the environment and to nontargets (including humans in the surrounding communities) is expected to be minimal.

Specific safety requirements include (but are not limited to): site-specific fumigant management plans; respiratory protection; buffer zones that restrict all but supervisors and those applying pesticides; notification of relevant treatments to workers that handle commodities; and community-wide notification of any recent or ongoing methyl bromide utilization (EPA, 2006).

Consumers are unlikely to be impacted by handling a commodity which has been fumigated with methyl bromide because methyl bromide quickly dissipates from the surface of the commodity once it has been removed from the fumigation facilities. However, the shelf life of the commodity may be adversely affected (USDA–APHIS, 2010a). The primary injury caused by methyl bromide to fresh grapes for table use is internal browning. Browning is primarily of concern in green cultivars, where it would be readily apparent to customers (Leesch, 2008).

Some methyl bromide will enter the atmosphere during fumigation treatments that utilize the tarpaulin procedure outlined by PPQ treatment protocol (USDA-APHIS, 2010). However, the release of methyl bromide gas into the atmosphere will not result in any effects to air quality. The concern from this release is the addition of ozone depleting chemicals that can impact the ozone layer. This is a global concern and requires the analysis of other national and world uses which is discussed further under the Cumulative Impacts Section.

c. Summary

Based on the method and timing (postharvest) of its application, the proposed use of methyl bromide presented here poses minimal risk to human health. The use of methyl bromide also poses minimal risk to nontarget organisms, including terrestrial and aquatic species. Risk to human health and the environment is further reduced by other management practices such as community-wide notification of treatments, and site-specific fumigant management plans.

Potential environmental consequences of the proposed action include the addition of ODSs that can impact the ozone layer. Although the amounts of methyl bromide released under the proposed action may be considered negligible by comparison, this document examines the cumulative effects of the proposed action when added to other methyl bromide emissions.

C. Cumulative Effects

As a signatory of the Montreal Protocol, the United States has agreed to incrementally decrease the amount of methyl bromide produced and imported in the United States, and recognizes an exemption for those quantities needed for quarantine and preshipment treatments. This

provision has been added as an amendment to the Clean Air Act, section 604(d)(5). The amendment defines quarantine treatments as:

"… [those that] prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control, where: (i) Official control is that performed by, or authorized by, a national plant, animal, or environmental protection or health authority; (ii) quarantine pests are pests of potential importance to the areas endangered thereby and not yet present there, or present by not widely distributed and being officially controlled."

The EPA Interim Rule on The Process for Exempting Quarantine and Preshipment (QPS) Applications of Methyl Bromide (66 FR 37753) states that "… for the purposes of today's regulation, 'quarantine applications' include inter-state and inter-county treatments required to control quarantine pests." Thus, the quantity of methyl bromide required to perform the proposed action, along with the action itself, would be considered exempt from the restrictions set by the Montreal Protocol.

Given the possible environmental significance of the proposed action, it is important to evaluate impacts both at the local level as well as the global level. Should the spread of EGVM necessitate the fumigation all fresh grapes grown in the state of California for interstate movement and export, the total quantity of methyl bromide needed for the proposed action is estimated to be approximately 189 tons, following the PPQ mandatory treatment schedule set forth by T101. If treatment is performed on only those fresh grapes grown within the proposed quarantine area, the proposed action would utilize approximately 24 tons of methyl bromide in order to facilitate interstate movement and export. The Federal Order, however, only requires treatment for grapes from vineyards known to have positive finds of EGVM and those vineyards within 200 meters of such vineyards. Under these conditions, the 24 ton estimate for methyl bromide use would greatly exceed the actual use for the currently infested area.

According to reports published by California Department of Pesticide Regulation, there were 2,823 tons of methyl bromide used in California in 2008 (CDPR, 2009). When compared to the total methyl bromide use for the State in 2008, the amount required for treatment of all fresh grape production in California would represent 6.8 percent of the total amount used in the state. If all fresh grapes produced in the currently infested 7 counties were to be treated, it would represent less than 1 percent of methyl bromide use in California.

The global human use of methyl bromide in 2006 has been estimated to be 78,815 tons (USDA–APHIS, 2007b). If the amount of methyl bromide needed to treat all fresh grapes from California (estimated to be 189 tons) were to be used, it would represent less than a 0.24 percent increase in world usage. Therefore, we conclude that the requirements of the Federal

Order will not result in significant cumulative effects from the use of methyl bromide.

D. Threatened and Endangered Species

Section 7 of the Endangered Species Act and its implementing regulations require Federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species or result in the destruction or adverse modification of critical habitat.

Treatments of fresh grapes for table use, using methyl bromide fumigation for their movement outside of the quarantine area, will have no effect on listed species; these treatments are conducted in contained facilities where listed species and their habitats would not be present. At this time, no insecticides that could runoff or drift into habitats of listed species are required for movement of regulated articles.

V. Other Considerations

Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," focuses Federal attention on the environmental and human health conditions of minority and low-income communities and promotes community access to public information and public participation in matters relating to human health or the environment. This EO requires Federal agencies to conduct their programs, policies, and activities that substantially affect human health or the environment in a manner so as not to exclude persons and populations from participation in or benefiting from such programs. It also enforces existing statutes to prevent minority and low-income communities from being subjected to disproportionately high or adverse human health or environmental effects. APHIS has determined that the environmental and human health effects from the proposed are not expected to have disproportionate adverse effects to any minority or low-income populations.

EO 13045, "Protection of Children from Environmental Health Risks and Safety Risks," acknowledges that children, as compared to adults, may suffer disproportionately from environmental health and safety risks because of their developmental stage, greater metabolic activity levels, and behavior patterns. This EO (to the extent permitted by law and consistent with the agency's mission) requires each Federal agency to identify, assess, and address environmental health risks and safety risks that may disproportionately affect children. APHIS has determined that the environmental and human health effects from the proposed action are not expected to have disproportionate effects to children.

VI. Listing of Agencies and Persons Consulted

California Department of Food and Agriculture
Plant Health and Pest Prevention Services
1220 N Street
Sacramento, CA 95814–5607

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine
Emergency Management
4700 River Road, Unit 160
Riverdale, MD 20737–1236

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Policy and Program Development
Environmental Services
4700 River Road, Unit 149
Riverdale, MD 20737–1238

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine
Environmental Compliance
4700 River Road, Unit 150
Riverdale, MD 20737–1229

U.S Department of Agriculture
Animal and Plant Health Inspection Services
Plant Protection and Quarantine
State Plant Health Director
650 Capital Mall, Suite 6-400
Sacramento, CA 95814

VII. References

Australian Quarantine & Inspection Service, 1999. Draft import risk analysis for the importation of fresh table grapes [*Vitis vinifera L.*] from California (USA). Canberra, Australia.

California Department of Pesticide Regulation, 2009. Pesticide Use Reporting – 2008 Summary Data. (Online). Available: http://www.cdpr.ca.gov/docs/pur/pur08rep/chmrpt08.pdf

CDPR—See California Department of Pesticide Regulation.

Leesch, J., Smilanick, J.L., J. Steven Tebbets, J.S., 2008. Methyl bromide fumigation of packed table grapes: Effect of shipping box on gas concentrations and phytotoxicity. Postharvest Biology and Technology (49) 2. Pp. 283–286

Pesticides News, 2008. Europe turns the tide of methyl bromide. (Online). Available: http://www.pan-uk.org/pestnews/Issue/pn79/pn79pp11-13.pdf

UNEP, MBTOC – See United Nations Environment Programme

United Nations Environment Programme, Methyl Bromide Technical Options Committee, 2007. Montreal Protocol on substances that deplete the ozone layer. 2006 assessment. UNEP, Ozone Secretariat, Nairobi, Kenya. (Online). Available: http://ozone.unep.org/Assessment_Panels/TEAP/Reports/MBTOC/index.shtml

USDA–APHIS—See U.S. Department of Agriculture, Animal and Plant Health Inspection Service

U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, 2010a. Treatment Manual 5/2010 - 45: Chemical treatments: fumigants: methyl bromide: tarpaulin fumigation. [Online]. Available: http://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/treatment_pdf/02_04_chemicaltreatmentsmbtarpfum.pdf.

U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 2010b. (Draft) Potential Economic Impact of the European Grapevine Moth (*Lobesia botrana*) in California. 11 pp.

U.S. Department of Agriculture, Animal and Plant Health Inspection Services, 2007a. Grape Commodity-based survey reference, cooperative agricultural pest survey. Dec. 2007.

U.S. Department of Agriculture, Animal and Plant Health Inspection Services, 2007b. Importation of solid wood packing material, supplement to the final environmental impact statement—October 2007. USDA–APHIS, Riverdale, MD.

U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 2003. Importation of solid wood packing material, final environmental impact statement—August, 2003. USDA–APHIS, Riverdale, MD.

U.S. Department of Agriculture, Cooperative State Research, Education and Extension Service, California Pest Management Center. 2010. California commercial crop database. (Online). Available: http://www.wrpmc.ucdavis.edu/Ca/CaCrops/prodstat.html.

U.S. Environmental Protection Agency, 2009. Ozone Layer Depletion Regulatory Programs; Methyl bromide questions & answers. April 14, 2009. (Online). Available: http://www.epa.gov/ozone/mbr/qa.html.

U.S. Environmental Protection Agency, 2008. Report of Food Quality Protection Act (FQPA) Tolerance Reassessment and Risk Management Decision (TRED) for Methyl Bromide, and Reregistration Eligibility Decision (RED) for Methyl Bromide's Commodity Uses. July, 2008. (Online). Available: http://www.epa.gov/oppsrrd1/REDs/methyl_bromide_tred.pdf.

U.S. Environmental Protection Agency, 2006. Report of Food Quality Protection Act (FQPA) Tolerance Reassessment and Risk Management Decision (TRED) for Methyl Bromide, and Reregistration Eligibility Decision (RED) for Methyl Bromide's Commodity Uses. August, 2006. (Online). Available: http://www.epa.gov/oppsrrd1/REDs/methyl_bromide_tred.pdf.

Venette, R.C., Davis, E.E., DaCosta, M., Heisler, H., and Larson, M., 2003. Mini Risk Assessment: Grape berry moth, Lobesia botrana (Denis & Schiffermuller) [Lepidoptera:Tortricidae]. Department of Entomology, University of Minnesota, St. Paul, MN.

WMO—World Meteorological Organization

World Meteorological Organization, Scientific Assessment of Ozone Depletion: 2006. Global ozone research and monitoring project—Report No. 50, 572 pp., Geneva, Switzerland, 2007. (Online). Available: http://www.esrl.noaa.gov/csd/assessments/ozone/2006/

Appendix A. European Grapevine Moth Regulated Articles

- Blackberry, Dewberry (*Rubus* spp)
- Bladder Campion (*Silene vulgaris*)
- Carnation (*Dianthus* spp.)
- European barberry (*Berberis vulgaris*)
- European privet (*Ligustrum vulgare*)
- False baby's breath (*Galium mollugo*)
- Gooseberries and currants (*Ribes* spp.)
- Grape (*Vitis* spp.)
- Jujube (*Ziziphus* jujube)
- Kiwifruit or Chinese gooseberry (*Actinidia chinensis*)
- Old man's beard (*Clematis vitalba*)
- Olive (*Olea europaea*)
- Persimmon (*Diospyros kaki*)
- Pomegranate (*Punica granatum*)
- Red clover (*Trifolium pretense*)
- Rosemary (*Rosmarinus officinalis*)
- Sea squill (*Urginea maritime*)
- Smooth sumac (*Rhus glabra*)
- Spurge flax (*Daphne gnidium*)
- St. John's Wort (*Hypericum calycinum*)
- Stone fruit (plums, peaches, cherries, apricots, nectarines, etc.) (*Prunus* spp.)

- Plant litter, compost, winery/processing or harvesting waste and all other green waste residues of any regulated plant, plant part or plant product from the planting, growth, pruning, production, harvesting, processing and conveyances of regulated plants, plant parts or plant products.

- All farm/vineyard equipment and conveyances used in the planting, growth, pruning, production, harvesting and processing of regulated plants, plant parts or plant products.

- All living, dead, cut, fallen or other materials or products used in the cultivation, planting, growth, production, harvesting and processing of regulated plants, plant parts or plant products.